Embedding career education in the Victorian Curriculum F–10

Design and Technologies – Engineering principles and systems, Levels 7 and 8

An existing learning activity linked to a particular learning area or capability in the Victorian Curriculum F–10 can be easily adapted to incorporate career education, enriching students’ career-related learning and skill development.

1. Identify an existing learning activity

**Curriculum area and levels:** Design and Technologies – Engineering principles and systems, Levels 7 and 8

**Relevant content description:** Investigate the ways in which designed solutions evolve locally, nationally, regionally and globally through the creativity, innovation and enterprise of individuals and groups ([VCDSTS044](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTS044))

**Existing activity:** Researching the evolution of bike design over the last 100 years, including analysis of materials used in contemporary bikes and how they came to be used.

**Summary of adaptation, change, addition:** Exploring the roles associated with modern bike design and production and their crossover with different industries.

2. Adapt the learning activity to include a career education focus

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| Existing learning activity | Adaptations, changes or extensions that can be made |
| Students research the evolution of bike design over the last 100 years, including changes in materials used and design features. They create a flowchart of their findings. | Existing activity runs unchanged. |
| Students select a type of modern bike as a case study (i.e. mountain bike, e-bike, Olympic track cycling bike, bike for a wheelchair user, etc). They identify specific features of their chosen bike that differentiate it from a standard off-the-shelf contemporary bike and write a brief summary of these features, including what they are made of and how they are made. They explain what those features contribute to the bike’s purpose – i.e. why are track bikes made from aluminium or carbon fibre and have no brakes?  | Students research how the type of bike they chose to study came to be on the market. They record what roles were involved in the design of the specific features they identified – i.e. who worked out that carbon fibre would be a good material for elite bike racing? Who tests new materials and features? How do bike companies convince people to spend more money on these features? What careers and interests lead to work in product design or manufacture (engineering, science, design and technologies, etc)?Students discuss how the engineering of new bike designs and types intersects with other industries. For example, science helps develop new materials that make bikes faster and more lightweight; more people might ride bikes if they were more comfortable, leading to better health. What does this say about the flexibility and transferability of skills and interests? |
| Students do an oral presentation of their findings to the class. | Students present the bike of their choice, including a summary of the professional expertise that contributed to its design and production. After the presentations, they discuss any differences and similarities in roles associated with design, production, etc. of the different kinds of bikes. They discuss what elements of bike design/production/manufacture appealed to them and why. |

Considerations when adapting the learning activity

* Teacher may organise a trip to a local bike shop to view different types of bikes available. School policy regarding excursions should be followed.

Additional resources to help when adapting the learning activity

* Bicycle Network, [History of the bike](https://www.bicyclenetwork.com.au/tips-resources/inspiration/history-of-the-bike/)
* Bike Exchange, [Choosing the right bike](https://www.bikeexchange.com.au/blog/choosing-the-right-bike-bicycle-buying-advice)

Benefits for students

Know yourself – self-development:

* Students develop the ability to communicate effectively with others by presenting their findings and discussing similarities and differences across kinds of bikes.
* Students build skills in researching and organising relevant information using ICT.

Know your world – career exploration:

* Students investigate some aspects of industries, careers and occupations associated with bike design and manufacturing.
* Students learn about labour market opportunities by taking part in a discussion to explore career pathways.
* Students learn that different industries overlap with the creation of a product.

Manage your future – be proactive:

* Students develop the ability to think critically and creatively by analysing the features of modern bikes, what makes certain designs unique and explaining reasons for these features.
* Students identify how skills and interest can be transferred between different industries.
* As students identify the roles associated with innovation in product design, they see the value of embracing change in their professional futures.